Claim **1.** A method to determine the best fit parameters of a broadening model to be used to correct for the effects of band broadening in a chromatographic separation containing a separation device followed by two or more detectors comprising the steps of

a) Selecting a broadening model containing a set of adjustable parameters;
b) Injecting a sample containing a monodisperse component;
c) Collecting the signals from each of said detectors corresponding to said monodisperse component;
d) Forming a χ^2 model to be minimized over the peak of said monodisperse component using said collected signal of the most broadened detector signal as a reference against which the said other detector signals are to be broadened;
e) Minimizing the χ^2 model to determine said best fit parameters for each of said detector signals to be broadened so that their broadened and normalized shapes are a best fit to said shape of said detector producing said broadest temporal response.

Claim **2.** The method of Claim **1** where the minimization of said χ^2 model is achieved by use of a nonlinear least squares algorithm.

Claim **3.** The method of Claim **2** where said nonlinear least squares algorithm is of the type developed by Marquart.

Claim **4.** The method of Claim **1** where said χ^2 model to be minimized is

$\chi^2_i\left(\beta_i,\tau_i,\alpha_{ij}\right) = \int_{peak}\left(D_n(t) - \beta_i \int_{-\infty}^{\infty} D_i(t-\tau) B\left(\alpha_{ij},\tau-\tau_i\right) d\tau\right)^2 dt$, where said best fit parameters

are the β_i, α_{ij}, and τ_i; the i-detectors' responses as a function of time are the $D_i(t)$; and said model is minimized over said peak.

Claim **5.** The method of Claim **1** where said band broadening is caused by dilution.

Claim **6.** The method of Claim **1** where said broadening is caused by mixing.

Claim **7.** The method of Claim **6** where said mixing arises from inclusions caused by mechanical defects within the detector cells and/or connectors therefore.

Claim **8.** The method of Claim **1** where said broadening is caused by internal instrumental effects.

Claim **9.** The method of Claim **8** where said internal instrumental effects are caused by electronic filtering.

Claim **10.** The method of Claim **8** where said internal instrumental effects are caused by differences of the sample volume measured by each detector.

Claim **11.** A method to derive selected physical properties of a sample passing successively through a set of detectors using a combination of the signals produced by said detectors responding to said sample passing therethrough when some of said detectors exhibit band broadening of their signals, comprising the steps of

a) Applying a parameterized broadening function to said detector set to derive thereby a corresponding set of detector signals, all of which have comparable broadening; and

b) Using said detector signals now broadened, following application of said broadening function, to derive said selected physical properties of said measured sample.

Claim **12.** The method of Claim **11** where said application of said parameterized broadening function is given by $D_i^b(t)=\int_{-\infty}^{\infty}D_i(t-\tau)B(\alpha_{ij}',\tau-\tau_i')d\tau$ where $D_i^b(t)$ are the said detector signals now broadened, α_{ij}' and τ_i' are said best fit parameters of Claim **2**.

Claim **13.** The method of Claim **11** where said selected physical properties, to be determined from the relation $R(\theta)=K^*M_wcP(\theta)[1-2A_2M_wcP(\theta)]+O(c^3)$, are the weight averaged molar mass, M_w, and the root mean square radius, r_g, of said sample derived from concentration signals, $c(t)$, and the excess Rayleigh ratios, $R(\theta,t)$, derived from *i* light scattering signals from a detector set comprised of light scattering detectors, $D_i(t)$, and a dRI detector in sequence, said dRI detector producing a concentration signal exhibiting broadening relative to said light scattering detector signals, where said light scattering detector signals have been broadened.

Claim **14.** The method of Claim **11** where said detector signals are from a UV detector followed by a multiangle light scattering detector and said multiangle light scattering signals are broadened.

Claim **15.** The method of Claim **11** where said detector signals are from a refractive index detector followed by a viscometer detector and said refractive index detector signals are broadened.

Claim **16.** The method of **11** where said broadening function is given by

$B(t) = \int_{-\infty}^{\infty} \frac{1}{\sigma\sqrt{2\pi}} e^{-\tau^2/2\sigma^2} \frac{1}{w} U(t-\tau) e^{-(t-\tau)/w} d\tau$, where U(t-τ) =1 when t $\geq \tau$ and =0 when t<τ.

Claim **17.** The method of Claim **16** where said optimal parameters of said broadening function have been determined by the method of Claim **1**.

Claim **18.** A method to determine the delay volumes, τ_I, $i = 1$ to N-1, between N detectors in a chromatographic separation system using the method of Claim **2**.